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APPENDIX 7.1.3 CWF/FWF POST CLOSURE COST ESTIMATE

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1.0 INTRODUCTION

1.1 Explanation of Estimate

The following estimate is one of **nine** that details the costs for the development, operation, closure, and long-term care of the WCS Compact Waste Facility (CWF) and Federal Waste Facility (FWF). Table 1 is a complete list of the cost estimates, cost estimate scopes, and location for each in the license application. The estimate documented in this appendix is shaded in the table.

Table 1. WCS LLRW Disposal Facility Cost Estimate Breakdown

Cost Estimate Title	Cost Estimate Scope	Location in License Application
Common Facility Construction	Construction of buildings and systems that are common to both the Compact Waste Facility (CWF) and the Federal Waste Facility (FWF). (i.e. Administration/TCEQ Building)	Confidential Annex 1
CWF Construction	Initial construction activities required to permit the receipt of waste for CWF disposal.	Confidential Annex 2
FWF Construction	Initial construction activities required to permit the receipt of waste for FWF disposal.	Confidential Annex 3
Annual Operations	An estimate of the annual cost to provide materials for the development (excavation and liner placement) and closure (cover system placement) of the phased CWF and FWF. This includes activities beginning after Initial Construction up to the start of Closure.	Confidential Annex 4
Closure	Decontamination and decommissioning of the CWF and FWF buildings. The placement of potentially contaminated building waste into the appropriate disposal unit and installation of the final remaining sections of the cover systems.	Confidential Annex 5 (Cost Index also included in Appendix 6.5.1-1)
Unplanned Closure	An estimate of the cost to close the entire WCS LLRW Facility at a time when the maximum airspace has been provided in the FWF and CWF disposal units and the maximum amount of waste is staged in the staging buildings. The staged waste requires disposal, disposal unit open space filled, buildings decontaminated, decommissioned and placed in the disposal units, and the final cover installed.	Confidential Annex 6 (Cost Index also included in Appendix 6.5.1-2)
Post Closure	An estimate of the cost for monitoring, surveillance and general oversight of the closed Compact and Federal Waste Disposal Facilities over a 30 year period.	Appendix 7.1.3

Table 1. WCS LLRW Disposal Facility Cost Estimate Breakdown

Cost Estimate Title	Cost Estimate Scope	Location in License Application
Institutional Control	An estimate of the cost for monitoring, surveillance and general oversight of the closed Compact and Federal Waste Disposal Facilities over a 100 year period; occurring after the 30 year Post Closure period.	Appendix 7.2.3
Corrective Action	An estimate of the maximum cost to correct an unexpected failure of the LLRW disposal units. This failure is hypothesized to occur after the disposal units have been closed.	Confidential Annex 7 (Cost Index also included in Appendix 7.3.3)

1.2 What Is In the Post Closure Cost Estimate

This appendix contains the data that constitutes the Post Closure Cost Estimate. This cost estimate includes all costs expected during the post-closure period, namely:

- General support
- Periodic site walkover
- Environmental monitoring sample collection, analysis, interpretation, and reporting
- Monitoring of erosion pins
- Leachate monitoring, pumping, and shipment off-site for treatment
- Meteorological data collection and interpretation
- Infiltration data collection and interpretation
- Annual report preparation
- Land survey
- Survey of settlement monitors
- Maintenance
- Custodial Agency Oversight

The costs for the activities listed above apply for 5 years following closure of the CWF and for 30 years following closure of the FWF.

1.3 What Is NOT In the Post Closure Cost Estimate

The Post Closure Cost Estimate does not include

- Costs incurred prior to completion of the facility closure, whether as planned or under unplanned conditions.
- Institutional Control costs that are incurred upon transfer of the closed facility to the custodial care agency.
- Costs of assessing observed performance deficiencies; evaluating, selecting, and designing candidate corrective action options; and conducting corrective actions.

2.0 COST ESTIMATE STRUCTURE AND COMPONENTS

The cost estimate is made up of the following five cost documents:

- Explanation of the estimate (this document)
- Cost Estimate Index (Attachment A included as CD-ROM)
- Take-Off Quantity Calculations (Attachment B)

These documents are supported by these computer packages: Microstation® V8 and InRoads®; copies of which have been provided to TCEQ.

Explanation of the Estimate describes the overall structure and content of the cost estimate and walks through the various components that make up the estimate. It identifies the linkages between the cost estimate documents, the sources or methods used to calculate quantities, and the sources of rate information. It is a roadmap for how to make use of the other documents comprising the cost estimate; of which can be used to determine the completeness and accuracy of the cost estimate being addressed.

Cost Estimate Index is both a summary of the cost estimate and a matrix reference sheet that shows where applicable design, quantity, and rate information is provided in the other documents that make up the cost estimate. The index lists the total and costs by type (labor, material, subcontract, etc.) for each item that makes up the cost estimate. It sums costs by type and presents the subtotal estimated cost for all items in the estimate. The application of appropriate overheads, profit, contingency, and escalation is also documented at the end of the index.

The index is organized by assigning each component (listed in the description column) a unique task item number. This number is used as a means to clearly represent the task item as it associates to a drawing in the drawing set, a take-off quantity in the take-off quantity calculations, and a unit cost.

For Construction Drawings have been provided in the License Application as Appendix 3.0-2. This set of drawings provides the detail necessary for the extraction of quantities built into the cost estimates.

Take-Off Quantity Calculations are estimated by two methods: 1) written calculated quantities using dimensions directly off a construction set of drawings or 2) computer generated quantities using Microstation® V8 and InRoads® software. Hand written calculations of quantities are developed by use of the dimensions provided on the drawing set. Where dimensions were required for cost estimate purposes the dimensions have been provided on the drawing.

The disposal unit excavation and associated liners and covers have been drawn in three dimensions (3D) using CAD. Therefore, volumes and areas for complex geometry in the liner and cover systems are calculated more precisely by use of the CAD software than the use of simple geometric hand written estimates. The Take-off Quantity Calculation package contains the information relevant to the calculation of task item quantities in the cost estimate. A disk is provided with the calculation package that contains a table of contents of the supporting CAD drawings. This table of contents connects the task item, by name and number as listed in the cost index, to the relevant 3D drawing from which the quantity was calculated. The quantities for geometric areas can be checked using Microstation® and for geometric volumes using InRoads®.

3.0 COST ESTIMATE DEVELOPMENT

Timberline Estimating Software was used for the development of this estimate. The Timberline Estimating Software uses an RS Means® 2005 database derived from the RS Means® Civil Construction Cost Data electronic database. The cost data is divided into the 16 divisions according to the MasterFormat®, 1995 edition, system of classification and numbering as developed by the Construction Specification Institute (CSI). Each unit price line item listed in the Cost Index is assigned a unique 11-digit code based on the CSI MasterFormat® classification. This code number identifies the unit cost item by CSI division, group, phase, and item number within the estimating database. Unit costs developed in this manner and listed in the Labor Amount, Material Amount, and Equipment Amount columns in the Cost Index are “bare costs” and do NOT include overhead, profit, or contingency.

The Total Cost/Unit column on the cost estimate includes the following:

1. The arithmetic total of the columns: Labor Amount, Material Amount, Sub Amount, Equipment Amount, and then divided by the value in the Estimated Quantities column

Note: For purposes of the estimate the following applies:

1. “Cost” is defined as an unburdened or “bare” estimated number.
2. “Price” is defined as a fully burdened estimated number.
3. Material Amount includes total cost of materials for each Task Item.
4. Sub Amount includes subcontract price for each Task Item.
5. Equipment Amount includes total cost of equipment for each Task Item.
6. Labor Amount column includes total cost of labor for each Task Item

Each unit cost in the cost index is developed using the following procedure. This procedure is consistent with standard estimating practice as presented in RS Means®.

3.1 Labor Costs

Labor costs for each estimate item are developed as follows:

1. Identify the wages for each non-construction worker taken from RS Means® Environmental Remediation – Unit Prices; 11th Edition, 2005 adjusted for Andrews County.
2. Input the D/B wages into the RS Means® database where it will calculate a labor unit cost for the item. The database derives the unit labor cost by multiplying “crew hours” by the total D/B labor classifications and quantities shown within the “crew.”
3. RS Means® productivity rates are used by the database to calculate the labor costs as described in item #2 above. Productivity rates in RS Means® reflect productivity based on actual working conditions. These figures include time spent during a normal workday on tasks other than actual installation, such as material receiving and handling, mobilization at site, site movement, breaks, and cleanup. Productivity data is developed over an extended period so as not to be influenced by abnormal variations and reflects a typical average.

3.2 Material Costs

Material costs are developed using various sources as follows:

1. Costs for materials and other items within RS Means® represent U.S. national averages and are given in U.S. dollars. National average costs for materials are determined from contacts with manufacturers, dealers, distributor and contractors across the U.S. and Canada.
2. Some costs represent vendor or subcontractor quotations and are identified Attachment C as referenced within the Cost Estimate Index.

3.3 Subcontract

Subcontract items are listed as a single price and include labor, material, and equipment as necessary for delivery of the subcontract item.

3.4 Equipment Costs

The equipment costs are developed using various sources as follows:

1. Costs for equipment within RS Means® represent U.S. national averages and are given in U.S. dollars.
2. The cost to move construction equipment from an equipment yard or rental company to the job site and back again is not included in equipment costs. Mobilization costs have been included as a line item as shown in the Cost Estimate Index.

3.5 Partial Totals and Mark-ups

The labor, material, and equipment costs and subcontract prices are totaled as a **subtotal** at the end of the Cost Index and is the total of all the costs listed in the Total Amount column. The

Partial Total is the total price for all the costs included in the Cost Index with the following mark-ups:

1. Overhead and Profit (OH&P): This includes mark-up rates for material and equipment and for labor costs. The material and equipment OH&P is 5 percent (RS Means® 2005) and accounts for the fact that the estimate includes project labor that would otherwise be captured through a larger markup. The Labor OH&P is 55.5 percent (RS Means® 2005).
2. Contingency is included at 10.0 percent (RS Means® 2005). This mark-up amount is used based on the use of “for construction” and other design products.
3. Escalation from 2005 to 2007 dollars is also accomplished through use of an adder of 5.12 percent of all other costs.

Escalation for 2005 to 2007 dollars was accomplished using data available from the US Bureau of Labor Statistics. The final Consumer Price Index (CPI) for January 2005 was found 111.4, while the interim CPI at December 2006 was shown to be 117.1 (as of March 9, 2007; found at <http://www.bls.gov/news.release/cpi.nr0.htm>). These values correspond to an overall increase in the CPI of 5.12 percent.

Subcontract administration and Engineering are not included since no construction activities are included in the Post Closure Cost estimate.

3.6 Cost Estimate Summary

The WCS post closure cost estimate is based on maintaining a constant level of required activities throughout the post closure period. However, the magnitude of post closure activities is directly dependent upon the volume of waste disposed and the size for the facility over which post closure activities must be conducted, as described in Appendix 12.1.4-2.

Direct costs were estimated to total about \$1.06 million per year. Markups included:

- Labor overhead and profit (55.5 percent)
- Materials and subcontract overhead and profit (10 percent)
- Contingency (10 percent)
- Escalation from 2005 to 2007 (5.12 percent)

Markups added about \$0.61 million per year, bringing the total estimated Post-Closure annual costs to about \$1.68 million per year.

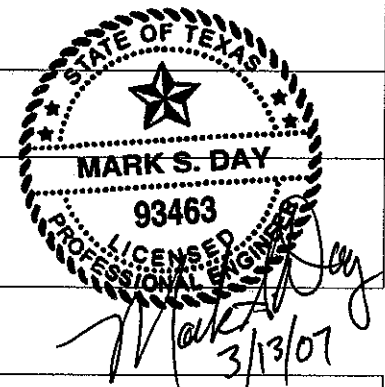
Details of the cost estimated are included in this appendix on the accompanying CD-ROM in the file named “WCS Post Closure Cost Index.xls”

**ATTACHMENT A: COMPACT DISK OF POST-CLOSURE
COST INDEX**

**ATTACHMENT B: TAKE-OFF QUANTITY CALCULATIONS;
POST CLOSURE**

CALCULATION COVER SHEET

Project No.: 39400032.70001	Calc. No.: WCS-RDB-006
Client: Waste Control Specialists	
Associated Report Title: (if applicable) TCEQ LOC 063006	
Calc. Title (Problem Statement): Post Closure Cost Estimate; Quantity Calculations; Appendix 7.1.3	
Information Given:	
Assumptions:	
References:	



REVIEW ASSIGNMENT

Assigned Checker: Emerson Zamora	No Check Required _____ (PM Approved)
Type of Calculation:	Scope of Review: P - Partial C - Complete
<input type="checkbox"/> Hand Calculation <input checked="" type="checkbox"/> Spread Sheet Calculation <input type="checkbox"/> Computer Program Calculation <input type="checkbox"/> Other _____	<input checked="" type="checkbox"/> Math Check - P or C <input type="checkbox"/> Method of Analysis - P or C <input checked="" type="checkbox"/> Input Information - P or C <input type="checkbox"/> Assumptions - P or C <input type="checkbox"/> Compare w/Previous Calculations - P or C <input type="checkbox"/> Other

REVISION BLOCK

Rev.	Originator	Date	Checker	Date	PM	Date	Comments (optional)
0	RBaird <i>MB</i>	03/11/07	E Zamora <i>EZ</i>	03/11/07	<i>EZ</i>	3/13/07	

	A	B	C	D	E	F	G	H	I	J	K
1	QUANTITY CALCULATION FOR POST-CLOSURE COST ESTIMATES										
2	3/9/087										
3	The purpose of this Cost Estimate is to state the expected annual costs during the Post-Closure (PC) Period.										
4	Factors in Product										
5	Task Item	Description	Quantity Justification/Explanation	A	Units	B	Units	C	Units	A*B*C	Units
7	8.1.1	Office trailer, furnished	Rented 12 months per year.								
8	8.1.2	Office storage boxes	Rented 12 months per year.								
9	8.1.3	Field Office Equipment	Rented 12 months per year.								
10	8.1.4	Office Expense:Telephone	Nominal for field office per Means; 12 mo/yr								
11	8.1.5	Office Expense:lights etc	Nominal for field office per Means; 12 mo/yr								
12	8.1.6	Office Expense:Water	Nominal for field office per Means; 12 mo/yr								
13	8.1.7	PC Manager	Full time year round; 2080 hr/yr								
14	8.1.8	Secy/Data Entry Clerk	Full time year round; 2080 hr/yr								
15	8.1.9	Security	16 hr/day, 7 day/wk = 8760 hr/yr	24	hr/pers-day	365	day/yr	1	pers	8,760	hr/yr
16	8.1.10	Pickup Truck	Rented 12 months per year.								
17	8.1.11	Office Equipment	Rented 12 months per year.								
18	8.1.12	Office Supplies	Nominal for field office per Means; 12 mo/yr								
19											
20	8.2.1	CHP/Environmental Scientist	2 days per month = 192 hr/yr	12	mo/pers-yr	16	hr/mo	1	pers	192	hr/yr
21	8.2.2	Environmental Technician	2 days per month = 192 hr/yr	12	mo/pers-yr	16	hr/mo	1	pers	192	hr/yr
22	8.2.3	Pickup	Rented 12 months per year.								
23											
24	8.3.1	CHP/Environmental Scientist	1/0.5 hour per sample; See Worksheet "EnvMon-PC"							1,391	hr/yr
25	8.3.2	Environmental Technician	1/0.5 hour per sample; See Worksheet "EnvMon-PC"							1,391	hr/yr
26	8.3.3	Geotech Technician		10	Erosion Pin Sets/yr	2	hr/pin set	2	pers	40	hr/yr
27	8.3.4	Pickup	Rented 12 months per year.								
28	8.3.5	Sampling Supplies	Number of samples; See Worksheet "EnvMon"							2,223	hr/yr
29											
30	8.4.1	CHP/Environmental Scientist	0.1 hr per analysis result; See Worksheet "EnvMon-PC"	1,135	ea/yr	0.10	hr/ea			114	hr/yr
31	8.4.2	Environmental Technician	0.1 hr per analysis result; See Worksheet "EnvMon-PC"	1,135	ea/yr	0.10	hr/ea			114	hr/yr
32											
33	8.5.1	Sample Analyses	See Worksheet "EnvMon-PC"	1,135							
34											
35	8.6.1	CHP/Environmental Scientist	4 hr/wk = 208 hr/yr	4	hr/wk	52	wk/yr			208	hr/yr
36	8.6.2	Environmental Technician	8 hr/wk = 416 hr/yr	8	hr/wk	52	wk/yr			416	hr/yr
37	8.6.3	Leachate Pump & Treat	See Worksheet "Leachate"	75,000	gal/yr	1	ea			75,000	gal/yr
38											
39	8.7.1	CHP/Environmental Scientist	20 hr/mo = 240 hr/yr	20	hr/mo	12	mo/yr			240	hr/yr
40	8.7.2	Environmental Technician	16 hr/mo = 192 hr/yr	16	hr/mo	12	mo/yr			192	hr/yr
41											
42	8.8.1	CHP/Environmental Scientist	20 hr/mo = 240 hr/yr	20	hr/mo	12	mo/yr			240	hr/yr
43	8.8.2	Environmental Technician	16 hr/mo = 192 hr/yr	16	hr/mo	12	mo/yr			192	hr/yr

	A	B	C	D	E	F	G	H	I	J	K
1	QUANTITY CALCULATION FOR POST-CLOSURE COST ESTIMATES										
2	3/9/087										
3	The purpose of this Cost Estimate is to state the expected annual costs during the Post-Closure (PC) Period.										
4	Factors in Product										
5	Task Item	Description	Quantity Justification/Explanation	A	Units	B	Units	C	Units	A*B*C	Units
44											
45	8.9.1	CHP/Environmental Scientist	80 hr/yr								
46	8.9.2	Civ/Geotech Engr	80 hr/yr								
47	8.9.3	Environmental Technician	80 hr/yr								
48											
49	8.10.1	Surveying, Topo								90.0	ac
50		FWF; Eng Dwg C0.07		2,097	ft	1,480	ft	43,560	sf/ac	71.0	ac
51		CWF; Eng Dwg C0.07		900	ft	900	ft	43,560	sf/ac	19.0	ac
52	8.10.2	Civ/Geotech Engr	4 wk/yr * 40 hr/wk = 160 hr/yr	4	wk/pers-yr	40	hr/wk	1	pers	160	hr/yr
53											
54	8.11.1	Survey Crew; Settlement	1 Survey Crew, 24 Settlmt Mons	24	SetlmtMon/yr	0.50	hr/Stlmt Mon	2.00	pers	3	day/yr
55											
56	8.12.1	Civ/Geotech Engr	3 mo/yr @ 160 hr/mo = 480 hr/yr	3	mo/pers-yr	160	hr/mo	1	pers	480	hr/yr
57	8.12.2	Equipment Operator, Light	3 mo/yr @ 160 hr/mo = 480 hr/yr	3	mo/pers-yr	160	hr/mo	1	pers	480	hr/yr
58	8.12.3	Laborer	2 persons, 3 mo/yr @ 160 hr/mo = 960 hr/yr	3	mo/pers-yr	160	hr/mo	2	pers	960	hr/yr
59	8.12.4	Front End Loader/Backhoe	3 mo/yr	3	mo/yr					3	mo/yr
60	8.12.5	Farm Tractor with Implements	3 mo/yr	3	mo/yr					3	mo/yr
61	8.12.6	Pickup Truck	3 mo/yr	3	mo/yr					3	mo/yr
62	8.12.7	Flat Bed Utility Truck	3 mo/yr	3	mo/yr					3	mo/yr
63	8.12.8	Power and Hand tools	3 mo/yr	3	mo/yr					3	mo/yr
64											
65	8.13.1	Office trailer, furnished	Rented 12 months per year.								
66	8.13.2	Office storage boxes	Rented 12 months per year.								
67	8.13.3	Field Office Equipment	Rented 12 months per year.								
68	8.13.4	Office Expense:Telephone	Nominal for field office per Means; 12 mo/yr								
69	8.13.5	Office Expense:lights etc	Nominal for field office per Means; 12 mo/yr								
70	8.13.6	Office Expense:Water	Nominal for field office per Means; 12 mo/yr								
71	8.13.7	Regulatory Agency: Scientist	6 mo/yr = 1040 hr/yr	6	mo/pers-yr	173	hr/mo	1	pers	1,040	hr/yr
72	8.13.8	Regulatory Agency: Engineer	6 mo/yr = 1040 hr/yr	6	mo/pers-yr	173	hr/mo	1	pers	1,040	hr/yr
73	8.13.9	Regulatory Agency: Procurement	6 mo/yr = 1040 hr/yr	6	mo/pers-yr	173	hr/mo	1	pers	1,040	hr/yr
74	8.13.10	Regulatory Agency: Manager	6 mo/yr = 1040 hr/yr	6	mo/pers-yr	173	hr/mo	1	pers	1,040	hr/yr
75	8.13.11	Regulatory Agency: Secy	6 mo/yr = 1040 hr/yr	6	mo/pers-yr	173	hr/mo	1	pers	1,040	hr/yr
76	8.13.12	Pickup Truck	6 mo/yr								

	A	B	C	D	E	F	H	J
1	WCS LLRW DISPOSAL FACILITY; POST-CLOSURE							
2	3/9/2007							
3	Source: Addendum No. 1, Appendix 2.10.1-2: "Radiological Environmental Monitoring Plan"; Table 12, March 16, 2007							
4	(R070605 REMP ADD NO 1 Rev 1. TABLES.rev.doc)							
5			# Locs; Post Clos	Collections Annually	Time to Collect (hr)	Analyses Annually	Means Remed Unit Prices 2005	2005 Means Ref (33 02 22:)
9	Monthly Composite of Weekly Samples							
10	Air: Gross Alpha/Beta	8	416	0.5	104	\$47	40-09154-7852	
11	Air: Alpha Isotopic	8	416	0.5	104	\$854	22-01954-7811 thru 29-09154-7818	
12	Air: Gamma Isotopic	8	416	0.5	104	\$231	35-09154-7831 & 36-09154-7832	
13	Air: Strontium-90	8	416	0.5	104	\$110	33-09154-7824	
14								
15	Monthly							
16	Air: Liquid Scintillation	5	60	1	60	\$442	37-09154-7841 & 38-09154-7842	
17								
18	Quarterly							
19	Ambient: TLD	22	88	1	88	\$50		
20	Ambient: Dose Rate Survey	22	88	1	88			
21	Air: Radon	8	32	1	32	\$140		
22	Water: Gross Alpha/Beta	4	16	1	16	\$46	88-09154-7982	
23	Water: Alpha Isotopic	4	16	1	16	\$822	45-09154-7911 thru 53-09154-7919	
24	Water: Gamma Isotopic	4	16	1	16	\$117	70-09154-7951 thru 75-09154-7956	
25	Water: Strontium-90	4	16	1	16	\$122	67-09154-7943	
26	Water: Liquid Scintillation	4	16	1	16	\$352	82-09154-7967 thru 86-09154-7972	
27								
28	Semi-Annually							
29	Water: Gross Alpha/Beta	8	16	1	16	\$46	88-09154-7982	
30	Water: Alpha Isotopic	8	16	1	16	\$822	45-09154-7911 thru 53-09154-7919	
31	Water: Gamma Isotopic	8	16	1	16	\$117	70-09154-7951 thru 75-09154-7956	
32	Water: Strontium-90	8	16	1	16	\$122	67-09154-7943	
33	Water: Liquid Scintillation	8	16	1	16	\$352	82-09154-7967 thru 86-09154-7972	
34								
35	Staggered Semi-Annually							
36	Water: Gross Alpha/Beta	24	48	1	48	\$46	88-09154-7982	
37	Water: Alpha Isotopic	24	48	1	48	\$822	45-09154-7911 thru 53-09154-7919	
38	Water: Gamma Isotopic	24	48	1	48	\$117	70-09154-7951 thru 75-09154-7956	
39	Water: Strontium-90	24	48	1	48	\$122	67-09154-7943	
40	Water: Liquid Scintillation	24	48	1	48	\$352	82-09154-7967 thru 86-09154-7972	
41								
42	Annually							
43	Ambient: TLD	1	1	1	1	\$50		
44	Ambient: Dose Rate Survey	1	1	1	1			
45	Air: Gross Alpha/Beta	1	1	1	1	\$47	40-09154-7852	
46	Air: Alpha Isotopic	1	1	1	1	\$854	22-01954-7811 thru 29-09154-7818	
47	Air: Gamma Isotopic	1	1	1	1	\$231	35-09154-7831 & 36-09154-7832	
48	Air: Radon	1	1	1	1	\$140		
49	Air: Strontium-90	1	1	1	1	\$110	33-09154-7824	
50	Air: Liquid Scintillation	1	1	1	1	\$442	37-09154-7841 & 38-09154-7842	
51	Soil: Gross Alpha/Beta	6	6	1	6	\$46	88-09154-7982	
52	Soil: Alpha Isotopic	6	6	1	6	\$822	45-09154-7911 thru 53-09154-7919	
53	Soil: Gamma Isotopic	6	6	1	6	\$117	70-09154-7951 thru 75-09154-7956	
54	Vegetation: Gross Alpha/Beta	5	5	1	5	\$46	88-09154-7982	
55	Vegetation: Alpha Isotopic	5	5	1	5	\$822	45-09154-7911 thru 53-09154-7919	
56	Vegetation: Gamma Isotopic	5	5	1	5	\$117	70-09154-7951 thru 75-09154-7956	

	A	B	C	D	E	F	H	J
1	WCS LLRW DISPOSAL FACILITY; POST-CLOSURE							
2	3/9/2007							
3	<u>Source: Addendum No. 1, Appendix 2.10.1-2: "Radiological Environmental Monitoring Plan"; Table 12, March 16, 2007</u> <u>(R070605 REMP ADD NO 1 Rev 1. TABLES.rev.doc)</u>							
4								
5			# Locs; Post Clos	Collections Annually	Time to Collect (hr)	Analyses Annually	Means Remed Unit Prices 2005	2005 Means Ref (33 02 22:)
57		Vegetation: Strontium-90	5	5	1	5	\$122	67-09154-7943
58		Vegetation: Liquid Scintillation	5	5	1	5	\$352	82-09154-7967 thru 86-09154-7972
59								
60				Total Collections	Total Collection Time (hr)	Total Analyses		
61				2,383	1,551	1135	\$296,239	
62								
63				Analysis Unit Cost			\$262	

	A	B	C	D	E	F	G
1	ANNUAL POST-CLOSURE INFILTRATION						
2							
3							
4	Post Closure Infiltration	CWF	Source		FWF-CDU	FWF-NCDU	Source
5	Infiltration (in./yr)	3.78E-02	Section 8.0-6.8 of Appendices 8.0-6 and Appendix 8.0-8		3.83E-02	3.83E-02	Section 8.0-6.8 of Appendices 8.0-6 and Appendix 8.0-8
6	Infiltration (m/yr)	9.60E-04	=B5*2.54/100		9.74E-04	9.74E-04	=E5*2.54/100 & F5*2.54/100
7							
8	Length (ft)	756	Eng Dwg C1.47		1346	542	CDU & NCDU: Eng Dwg C2.62
9	Width (ft)	767	Eng Dwg C1.47		1312	1312	CDU & NCDU: Eng Dwg C2.62
10	Area (sf)	579,852	=B9*B8		1,765,952	711,104	=E9*E8 & =F9*F8
11	Area (ac)	13.3	=B10/43560		56.9		=(E10+F10)/43560
12	Area (m2)	53,898	=B11*43560/3.28^2		230,244		=E11*43560/3.28^2
13							
14	Annual Volume (m3/yr)	51.8	=B9*B6		224.2		=E12*E6
15	Annual Volume (gal/yr)	13,664	=B14*3.28^3*7.4805		59,172		=E14*3.28^3*7.4805
16							
17	Total Annual Volume (gal/yr)	72,835	=B12+E12				
18							
19	Rounded Up to Nearest 5,000 (gal/yr)	75,000					